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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/696,052

Applicant(s)

CAZE ET AL.

Examiner

Jennifer A. Leung

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 November 2007 and 17 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 3,4,10-13 and 19-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-9 and 14-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Jennifer A. Leung
1/17/2008

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1797

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed November 6, 2007 has been carefully considered. Claims 3, 4, 10-13 and 19-25 are withdrawn. Claims 1, 2, 5-9 and 14-18 are under consideration.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 2, 5-9 and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tonkovich et al. (WO 01/12312) in view of Hammel et al. (US 4,803,188).

Regarding claims 1, 2 and 7, Tonkovich et al. (for example, page 7, line 29, to page 9, line 2; page 10, line 16, to page 12, line 6) discloses an apparatus comprising:

a plurality of microchannel walls (i.e., defined by porous material **106**; see FIGs. 1-6 and 7b) defining at least one microchannel **100**; wherein at least one coating layer is adhered to the plurality of microchannel walls **106**, and wherein said coating layer may include a catalyst support and a catalyst (i.e., porous material **106** may be coated with a second porous material **600** acting as a support for catalyst **108**, see FIG. 6 and page 9, lines 24-28; see also page 11, lines 26-29).

Tonkovich et al. discloses that, “the porous material **106** may be a porous support of non-catalytic material with catalytic material **108** placed thereon,” (see page 8, lines 28-29), such as a material comprising metal, ceramic or composite (see page 11, lines 26-29). Tonkovich et al., however, is silent as to whether the porous material **106** may consist of, specifically, a glass frit.

Hammel et al., as best understood, teaches a glass frit (i.e., a microporous glass; see column 1, lines 15-27; column 2, line 5 to column 3, line 14; see also Example 1), the glass being suitable for supporting a catalyst material.

It would have been obvious for one of ordinary skill in the art at the time the invention was made to select a glass frit for forming the porous material **106** of the microchannel walls in the apparatus of Tonkovich et al., on the basis of suitability for the intended use and absent a showing of unexpected results thereof, because the mechanical strength, thermal stability, crush strength, and dimensional stability inherent of the microporous glass (glass frit) would make the material highly suitable as a catalyst support, as taught by Hammel et al.

Regarding claim 5, Tonkovich et al. discloses that at least one of the plurality of microchannel walls may further comprise a porous membrane (e.g., the apparatus may be configured such that products diffuse through the porous material **106**; FIG. 3; page 9, lines 3-7).

Regarding claim 6, the modified apparatus of Tonkovich et al. structurally meets the limitations set forth in this product-by-process claim because the claimed product is the same as, or obvious from, the product of the prior art. The determination of patentability is based on the product itself (i.e., at least one coating layer **600,108** on at least one microchannel wall **106**), and not its method of production (i.e., by slurry application). If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). In any event, Tonkovich et al. further discloses that the coating layer may be applied to the microchannel walls by filling the microchannel with a slurry (e.g., via a slurry dipping method; see Examples 1 and 2).

Regarding claims 8 and 9, Tonkovich et al. further discloses that the catalyst support may comprise alumina (e.g., a catalyst of Rh-MgO/Al₂O₃; see Example 1). Although Tonkovich et al. is silent as to the use of a sol binder in the coating process, the modified apparatus of Tonkovich et al. structurally meets the limitations set forth in this “product-by-process” claim because the claimed product is the same as, or obvious from, the product of the prior art. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding claims 14 and 15, Tonkovich et al. discloses that the catalyst material may comprise a material selected from group IVA, VA, VIIA and VIII of the periodic table (see page

Art Unit: 1797

11, lines 30-32), wherein the catalyst material is suitable for conducting a variety of catalytic processes (see listing on page 12, lines 16-27). Although Tonkovich et al. does not specifically disclose that the catalyst material comprises platinum, nickel oxide, silicon carbide, or silicon nitride, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to select an appropriate catalyst material for the apparatus of Tonkovich et al., on the basis of suitability for the intended use and absent a showing of unexpected results thereof (i.e., for conducting a particular catalytic process within the apparatus, such as one of the processes indicated at page 12, lines 16-27).

Regarding claims 16-18, because the microstructure of Tonkovich et al. comprises each of the claimed structural components, the microstructure should, inherently, be capable of operating under an internal pressure within the instantly recited ranges, absent a showing otherwise. Tonkovich et al., as an example, further discloses that for the particular catalytic process of steam reforming, the apparatus is capable of operating under a pressure range from 0 to 350 psig (see Example 3), which is well within the instantly recited ranges.

4. Claims 1, 2, 5-9 and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Claus et al. (*Catalysis Today* 67 (2001) 319-339) in view of Hammel et al. (US 3,843,341).

Regarding claims 1 and 2, Claus et al. discloses an apparatus (see section 4.1, beginning on page 328; see also, section 5. *Catalysis-on-a-chip* and section 6. *Multibatch reactors for the fast screening of gas-liquid reactions*) comprising:

a plurality of microchannel walls defining at least one microchannel (i.e., defined by each microstructured inlay; see FIGs. 10a, 10b; see also FIG. 12(a)); at least one coating layer adhered to the plurality of microchannel walls defining said at least one microchannel, the coating layer

Art Unit: 1797

including a catalyst support and a catalyst (i.e., “Each microreactor is then filled with a microstructured inlay containing one catalyst as a catalytic active coating on top of its microchannels,” page 328, first paragraph under section 4.1); wherein the coating layer includes a catalyst support and a catalyst (e.g., see FIG. 12(c) and 12(d), wherein Ag or Ru catalyst is supported on Al_2O_3). Claus et al. further discloses that the microstructured catalyst inlays may be made of glass (see page 328, second column, last paragraph).

Claus et al., however, does not specifically indicate that the glass comprises a glass frit.

Hammel et al., as best understood, teaches a glass frit (i.e., a microporous glass; see column 1, lines 15-27; column 2, line 5 to column 3, line 14; see also Example 1), the glass being suitable for supporting a catalyst material.

It would have been obvious for one of ordinary skill in the art at the time the invention was made to select a glass frit for forming the plurality of microchannel walls in the apparatus of Claus et al., on the basis of suitability for the intended use thereof, because the mechanical strength, thermal stability, crush strength, and dimensional stability inherent of a microporous glass (glass frit) would have made the material highly suitable as a catalyst support, as taught by Hammel et al.

Regarding claim 5, the microporous glass material defining each of the microstructured inlays of the modified apparatus will inherently define a porous membrane, since a gas is inherently capable of diffusing through the pores within the glass material (e.g., depending on the combination of a particular gas and a particular pore size of the glass).

Regarding claim 6, the modified apparatus of Claus et al. structurally meets the limitations set forth in this product-by-process claim because the claimed product is the same as,

Art Unit: 1797

or obvious from, the product of the prior art. The determination of patentability is based on the product itself (i.e., at least one coating layer on at least one microchannel wall), and not its method of production (i.e., by slurry application). If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding claim 7, Claus et al. discloses that the coating layer may comprise a plurality of coating layers (i.e., mixtures of different active components obtained by sequential wet impregnation; see section 4.5.1 *Library preparation*, on page 333).

Regarding claims 8 and 9, Claus et al. discloses that the catalyst support may comprise alumina (e.g., see FIG. 12(c) and 12(d), wherein Ag or Ru catalyst is supported on Al₂O₃; see also section 4.5.1 *Library preparation*). Although Claus et al. does not specifically disclose the use of a sol binder in the coating method, the modified apparatus of Claus et al. structurally meets the limitations set forth in this “product-by-process” claim because the claimed product is the same as, or obvious from, the product of the prior art. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). In any event, Claus et al. discloses that the use of sol-gel deposition of catalyst coating layers is conventional in the art (see page 320, first column, third paragraph), and also, the exemplary coating layer of Ru-Al₂O₃

in FIG. 12(d) is formed by sol-gel deposition.

Regarding claims 14 and 15, Claus et al. discloses that the catalyst may comprise a material selected from the group consisting of groups IVA, VA, VIIA and VIII of the periodic table, including platinum (see, for example, page 333, under section 4.5.1 *Library preparation*).

Regarding claims 16-18, because the microstructure apparatus of Claus et al. comprises each of the claimed structural components, the microstructure apparatus should, inherently, be capable of operating under an internal pressure within the instantly recited ranges, absent a showing otherwise. Claus et al. further discloses that the apparatus may be configured as a chip-based system, wherein the apparatus is capable of operating at internal pressures up to 117 bar (see page 337, beginning at the second paragraph).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned

Art Unit: 1797

with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1, 2, 5-9 and 14-18 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-17 of copending Application No. 11/016,093. Although the conflicting claims are not identical, they are not patentably distinct from each other.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Regarding claims 1 and 2, Application '093 similarly claims a microstructure comprising: a plurality of microchannel walls defining at least one microchannel (see claim 1); at least one coating layer adhered to the plurality of microchannel walls defining said at least one microchannel, the coating layer including a catalyst support and a catalyst (see claim 1); wherein the plurality of microchannel walls, as best understood, comprise a frit of a material consisting of glass (see claim 2; also, claims 10, 14, 17).

Regarding claim 5, Application '093 similarly claims that at least one of the plurality of microchannel walls further comprise a porous membrane (see claims 3 and 4).

Regarding claim 6, the microstructure of Application '093 structurally meets the limitations set forth in this product-by-process claim because the claimed product is the same as, or obvious from, the product of the prior art. The determination of patentability is based on the product itself (i.e., at least one coating layer on at least one microchannel wall), and not its

Art Unit: 1797

method of production (i.e., by slurry application). If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). In any event, Application '093 similarly claims that at least one coating layer is applied to the plurality of microchannel walls by filling the at least one microchannel with a slurry (see, for example, claims 10 and 17).

Regarding claim 7, Application '093 similarly claims that the at least one coating layer comprises a plurality of coating layers (see claim 5).

Regarding claim 8, Application '093 similarly claims that the catalyst support comprises a sol binder (see claim 1; also claim 10).

Regarding claim 9, Application '093 is silent as to claiming that the sol binder comprises alumina. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select an alumina sol binder for the sol binder in Application '093, on the basis of suitability for the intended use and absent a showing of unexpected results thereof, because the Examiner takes Official Notice that alumina is a well known and widely used catalyst support material in the art.

Regarding claims 14, Application '093 similarly claims that the catalyst comprises a material selected from the group consisting of group IVA, VA, VIIA and VIII of the periodic table of elements (see claim 8).

Regarding claim 15, Application '093 similarly claims that the catalyst comprises a material selected from the group consisting of platinum, nickel oxide, silicon carbide and silicon nitride (see claim 9).

Regarding claims 16-18, because the microstructure of Application '093 comprises each of the claimed structural components, the microstructure should, inherently, be capable of operating under an internal pressure within the instantly recited ranges, absent a showing otherwise.

6. Claims 1, 2, 5, 6 and 16-18 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-13 of copending Application No. 11/016,645. Although the conflicting claims are not identical, they are not patentably distinct from each other.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Regarding claims 1 and 2, as best understood, Application '645 similarly claims a microstructure comprising:

a plurality of microchannel walls (e.g., defined by the porous membrane, first plate and second plate; see claim 1) defining at least one microchannel (e.g., a first microchannel and a second microchannel; see claim 1); at least one coating layer adhered to the plurality of microchannel walls defining said at least one microchannel, the coating layer including a catalyst support and a catalyst (e.g., a microporous material comprising a catalyst; see claims 12 and 13); wherein the plurality of microchannel walls comprise a frit of glass material (see claims 1 and 5; a mesoporous or macroporous membrane made of glass; also, first and second plates made of glass; see claims 1, 4 and 5).

Regarding claim 5, Application '645 similarly claims that the at least one of the plurality of microchannel walls further comprises a porous membrane (see claim 1).

Regarding claim 6, the microstructure of Application '645 structurally meets the limitations set forth in this product-by-process claim because the claimed product is the same as, or obvious from, the product of the prior art. The determination of patentability is based on the product itself (i.e., at least one coating layer on at least one microchannel wall), and not its method of production (i.e., by slurry application). If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding claims 16-18, because the microstructure of Application '645 comprises each of the claimed structural components, the microstructure should, inherently, be capable of operating under an internal pressure within the instantly recited ranges, absent a showing otherwise.

Response to Arguments

7. Comments regarding the rejection of claims 1, 2, 5-9 and 14-18 under 35 U.S.C. 103(a) as being unpatentable over Tonkovich et al. in view of Hammel et al.

Applicant (beginning in the last paragraph on page 6) argues,

“Tonkovich does not teach or suggest glass as material for walls, particularly not glass or glass-ceramic frit. Tonkovich may even be considered to teach away from glass, given the list of materials and desired properties, as ceramic is generally understood as having higher temperature capabilities and higher thermal conductivity capabilities than glass, and metal is generally of higher thermal conductivity than ceramic. Hammel adds nothing in this regard. Hamel deals with glass beads (see, for example, Fig. 1, the forth process step in the flowchart, in which the glass is beaded). The beads are intended for use as a catalyst carrier or support, and are made porous and then coated with catalyst by

Art Unit: 1797

the processes described. Frit is generally defined as a powdered material such as typically obtained by grinding or similar process, and as such typically contains highly non-uniform particles, and not the uniform and smooth articles typically of glass beads. Accordingly, Hammel does not suggest use of glass frit. Further, as far as applicants are aware, there is no suggestion in Hammel of forming walls of such beads, particularly not walls of a pressure-containing or pressure-resistant reactor as disclosed in the present application.”

The Examiner respectfully disagrees.

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In the instant case, the selection of a glass material, as an alternative to a ceramic or metal material, would have been a conventional design consideration to one having ordinary skill in the art. For example, Claus et al. discloses that materials such as metals, silicon, ceramics, and glass were known to be satisfactory for forming catalyst carrying microchannel walls (see, e.g., page 328, second column, last paragraph).

Also, it is noted that Tonkovich et al. merely states that ceramic and metals are the “preferred materials” for forming the microchannel walls (see, e.g., page 10, lines 22-24). Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. See MPEP 2123.

Furthermore, when the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result, *KSR*

Art Unit: 1797

International Co. v. Teleflex Inc., 82 USPQ2d 1385 (2007).

With respect to the Hammel et al. reference, the Examiner respectfully disagrees with Applicant's assertion that Hammel et al. fails to teach a glass frit. It is noted that Hammel et al. specifically teaches that the glass articles, such as the glass beads, comprise glass frit --

"After a glass of the above composition has been melted, the glass is particulated. Particulation can be achieved directly from the glass melt or can be achieved by first forming the glass into a shape-retaining article and then mechanically breaking it. Particle size can be controlled by crushing or grinding, followed by sieving the particles through standard mesh screens. Alternatively, the glass can be particulated by directly quenching the glass melt with a suitable fluid... if the glass is particulated by mechanically breaking or direct quenching of the melt, further shaping or beading is necessary." (see column 5, lines 53-67).

"The molten glass was particulated to a frit by a blowing cold stream of air on the glass as it was poured from the crucible. The frit was sieved, and the fraction passing through a No. 5 U.S. standard sieve and not through a No. 10 U.S. standard sieve was collected. The larger fragments collected on a No. 5 sieve were passed through a jaw crusher for very large particles and a roll crusher for smaller particles. Again, the fraction between the No. 5 and No. 10 sieve were collected." (column 14, lines 35-45).

It is further noted that the disclosure is not strictly limited to the shaping of the particulated glass or glass frit into "beads", since Hammel et al. states that the particulated glass or glass frit may be shaped, generally, into "glass articles" (see column 1, lines 15-27). The bead is merely an exemplary shaping for the glass frit. Thus, it would have been obvious for one of ordinary skill in the art to apply the teachings of Hammel et al. to the production of other shaped articles, including the catalyst carrying microchannel walls in the apparatus of Tonkovich et al. The mechanical strength, thermal stability, crush strength and dimensional stability inherent of the

Art Unit: 1797

microporous glass (glass frit) of Hammel et al. would make the material highly suitable for forming the catalyst carrying microchannel walls of Tonkovich et al.

8. Comments regarding the rejection of claims 1, 2, 5-9 and 14-18 under 35 U.S.C. 103(a) as being unpatentable over Claus et al. in view of Hammel et al.

Applicant (beginning in the second paragraph on page 7) argues,

“As noted by the Examiner, Claus does teach that glass may be included among the materials used to form the multiple "microstructured catalyst inlays" placed in parallel within the reactor module of Fig. 10(a) (page 329), which is intended for high-throughput parallel screening of multiple catalysts in a research or laboratory setting. However, there is no suggestion of a "plurality of microchannel walls compris[ing] a frit of a material selected from the group consisting of glass and glass-ceramic and combinations thereof" in the context of a catalyst-containing reactor as recited in the claim. As described immediately above, Hamel adds nothing in this regard.”

The Examiner respectfully disagrees.

As commented above, Hammel et al. does teach the use of a particulated glass or glass frit. And, as commented above, the disclosure is not strictly limited to the shaping of the particulated glass or glass frit into "beads", since Hammel et al. states that the particulated glass or glass frit may be shaped, generally, into "glass articles" (see column 1, lines 15-27). The bead form is merely an exemplary shaping for the glass frit. Thus, it would have been obvious for one of ordinary skill in the art to apply the teachings of Hammel et al. to the production of other shaped articles, including the catalyst carrying, glass microchannel walls in the apparatus of Claus et al. The mechanical strength, thermal stability, crush strength, and dimensional stability inherent of the microporous glass (glass frit) of Hammel et al. would make the material highly suitable for forming the catalyst carrying microchannel walls of Claus et al.

Art Unit: 1797

9. Comments regarding the provisional rejection of claims 1, 2, 5-9 and 14-18 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-17 of copending Application No. 11/016,093; and the provisional rejection of claims 1, 2, 5, 6 and 16-18 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-13 of copending Application No. 11/016,645.

The provisional rejections are restated herein because Terminal Disclaimers have not been filed.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

* * *

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449. The examiner can normally be reached on 9:30 am - 5:30 pm Monday through Friday.

Art Unit: 1797

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Jennifer A. Leung/
Examiner, Art Unit 1797
January 17, 2008